No definite conclusions can be drawn from these scattered observations. We think, however, enough positive findings were obtained to make it seem probable that this disease is one of metabolism and not of nervous origin. The question of acidosis is certainly worthy of further study,[37] and the hydrogen ion concentration of the blood might yield valuable information. We had not the facilities for performing this test.

Gardner's case showed a striking improvement on eliminative treatment and low protein diet. Also in our case an improvement dated from the time he began such a diet, though when he returned to a general diet the improvement continued. It is only fair to bear in mind that many observers have reported a tendency for this disease to improve with age, so it is quite possible that J. T. S.'s improvement was part of the natural sequence of events and had nothing to do with the low protein diet.

We should hardly agree with Diller and Rosenbloom, who thought that their patient's freedom from attacks while in the hospital was due to the low protein diet that he was getting. He had just had a very severe attack; in our patient's case after a very severe attack he is nearly always unusually well for a week or so. We do believe, however, that a low protein diet is worthy of a trial, and may, over a long period of time, have some influence over the number and severity of the attacks.[38]

THE ROLE OF SYPHILIS IN HYPERTENSIVE CARDIOVASCULAR DISEASE.[1]

By Henry Farnum Stoll, M.D.,

ASSISTANT PHYSICIAN TO THE HARTFORD HOSPITAL, HARTFORD, CONN.

The steadily increasing mortality from diseases of the cardiovascular system at a time when the deaths from the communicable diseases are decreasing, is a problem of great seriousness. The victims, for the most part, are not from the ranks of the aged who have run their course, but from those who have just attained that period of life when they should be of the greatest value to the family and the State.

---

[37] The patient has for several years been in the habit of taking potassium citrate when he felt an attack coming on. He is not certain whether it ever did any good.

[38] At the suggestion of Dr. W. B. Cannon, the effect of adrenalin was tried in one attack; the tendency of adrenalin to lessen the fatigability of muscle being the point in mind. Adrenalin 1 to 1000 solution ♏xv, was given subcutaneously every hour for three doses. The blood-pressure was raised 12 mm., but no change at all was found in the paralysis.

The effect of physostigmin was also tried in an attack. Gr. $\frac{1}{100}$ was given every hour for four doses (subcutaneously). This also failed to have any apparent effect on the paralyzed muscles.

[1] Read before the Hartford Medical Society, April 5, 1915.

That it is a question for serious thought the recent statistics of Louis I. Dublin,[2] of the Metropolitan Life Insurance Company, clearly show.

In the ten years ending with 1910 the mortality from cerebral hemorrhage and apoplexy had increased to 18.8 per cent.; that from organic diseases of the heart, 39.3 per cent. The deaths from Bright's disease showed an increase of 18.1 per cent., and most astounding of all the mortality from disease of the arteries had risen from 5.2 to 25.8, or 396.2 per cent.

An important factor, probably the determining factor in this vascular degeneration, is the strenuous life we lead in this country, where "step lively" is the watchword. But will overwork alone account for this? A perfectly constructed motor, properly cooled and oiled, will run a long time at high speed. But an imperfection in a bearing, a piston ring that binds, or a loose connecting rod, spells disaster.

To the abuse of alcohol, the poison of lead and lues, and hard labor, most of the arterial changes are attributed. While definite knowledge, in spite of much experimental work, is very meager, it is probable that there are a considerable number of toxins, endogenous and exogenous, that exert a deleterious effect on our cardiovascular tissue.

It has been recognized for many years that syphilis shows a marked predilection for the arteries; but it was not until the advent of the Wassermann reaction and the more recent luetin test of Noguchi that it became possible to ascertain its real importance. With a few exceptions the possibility that congenital lues might be the underlying cause in some of the hypertensive cases occurring in middle life does not appear to have been considered by writers on this subject.

In the discussion of a case of congenital syphilis, reported by Messenger[3] in 1871, which showed at autopsy an interstitial nephritis, it was suggested that such a condition might prove to be the starting-point of a nephritis in later life.

Southerland and Walker[4] found at autopsy on an infant of sixteen months, whose father had had lues and died of heart disease, an endarteritis of the cerebral arteries and an interstitial nephritis. They agree with Guthrie, whom they quote, that it is probable that both congenital and acquired syphilis plays an important role in the interstitial nephritis of the adult. Hintzelman[5] shares this view. Cassel[6] found renal changes in ten out of twelve infants with congenital lues who came to necropsy.

---

[2] American Journal Public Health, 1913, iii, 1272.

[3] Quoted by Armstrong, British Med. Jour., 1914, i, 958.

[4] British Med. Jour., 1903, i, 959.

[5] Zeitschr. f. Kinderh., 1913, ix, No. 1.

[6] Quoted by Power and Murphy, System of Syphilis, Oxford University Press, 1908, i, 358.

In a recent paper[7] I have cited several cases with hypertension, which were apparently associated with a prenatal syphilitic infection. The material for this article comprises four groups of individuals and being so divided, attacks the problem of cardiovascular disease from somewhat different angles.

The first comprises fifty patients seen in office and consultation work, and for the most part represents individuals who experienced but slight inconvenience from this condition and were not incapacitated from their duties.

The second group is made up of one of the terminal stages of arterial disease, viz., the apoplectics. The third group, a very small one, consists of widows whose husbands had died from one of the above causes. The fourth comprises individuals, one of whose parents either has some cardiovascular-renal disorder, or had died from apoplexy, sudden cardiac failure or "kidney trouble."

GROUP I.—There were in all 50 cases, all white, with a systolic pressure over 160. Thirty-five (70 per cent.) were women, 15 (30 per cent.) were men. This sex distribution is almost the exact opposite of Janeway's[8] statistics. In his series of 458 cases the males were 67 per cent. Nettleship,[9] however, found that of eighty children under thirteen years of age with interstitial nephritis, 64 per cent. were females against 36 per cent. males; and this is in accord with Sawyer,[10] whose 40 cases of interstitial nephritis under thirteen years of age showed 69 per cent. females and 31 per cent. males. In parenchymatous nephritis in children Nettleship found the males slightly in excess.

None of the cases in this series suffered from lead poisoning, but two had used alcohol to excess. The cases of Group I can, with considerable exactness, be placed into one of three classes.

A. Those who either admit a primary lesion or who are known to have lived in intimate association with one who had syphilis or whose children exhibit some manifestations of hereditary lues.

B. Those individuals who, denying a venereal infection, had either a family history of cardiovascular disease (often the sudden death of parent in early life) or whose history suggested congenital syphilis, whether in the patient or in some other member of the family.

C. Patients whose history suggests neither acquired nor hereditary syphilis.

Such a classification is open to criticism because of obvious possibilities or error. Thus Case 11 had been very devoted to a dipsomaniac brother, who had acquired syphilis and who now has a strongly-positive Wassermann. Her opportunities for infection were probably many, yet she not only gives no history suggestive of primary or secondary manifestations, but her ill health very definitely antedates the time of her brother's infection. Accordingly she is classed as an acquired case, though it is quite possible that it was an hereditary one, as both of her parents died of "kidney trouble."

---

[7] Stoll, Jour. Amer. Med. Assoc., 1914, lxiii, 1558.

[8] Archiv. Int. Med., 1913, xii, 755.

[9] Trans. Ophth. Soc., iii, 51. Quoted by Sawyer, vide No. 16.

[10] St. Thomas' Hospital Reports, 1906, xxxv, 459.

In like manner Case 41, placed in Class C, might be with some reason grouped with those probably exposed to syphilis, as her husband died from pernicious anemia. Acknowledging these limitations, this division, nevertheless, has much that is suggestive.

Taken as a whole the Wassermann test was made on 42 of the cases in this group, with 33⅓ per cent. reacting positively. The luetin test was used in 45 cases, 82 per cent. of whom were positive. In subdivision A of Group I are 17 individuals for the most part with a good family history, who either admit having had syphilis or were presumably exposed to infection in the family, or who have children exhibiting some signs of a congenital infection.

The Wassermann was positive in 61.5 per cent. of these cases and the luetin test in 76 per cent.

It is subdivision B of this group which consists of individuals from families prone to cardiovascular disease that I desire especially to draw your attention. There are 19 patients in this class and the Wassermann was positive in only 12 per cent., while the luetin test was positive in 89 per cent.

Neither the Wassermann nor the luetin test was positive in 17 cases, or 89 per cent., and one who reacted negatively to both tests (Case 28) is undoubtedly of specific origin, as will be evident when the history is reviewed in detail.

C. In the fourteen cases whose personal history does not suggest an acquired infection and whose family history is not that of cardiovascular disease the Wassermann was positive in 33⅓ per cent., and the luetin in 82 per cent. It is quite likely that these were chiefly acquired cases notwithstanding the negative history.

For years neurologists have recognized that syphilitic infection in certain families tends to be manifest by various disorders of the nervous system; thus a husband may be tabetic, the wife paretic, and certain children exhibit paresis or possibly cerebral syphilis. In one family mentioned by Nonne[11] paresis was present in three generations. There is much from the clinical stand-point to suggest a strain of spirochetes with special affinity for nervous tissue, and Nichols[12] has isolated a strain which appears to have this property. A study of the cases here presented suggests there is a type of familial cardiovascular syphilis. While the occurrence of these lesions in parent and child might be explained by the inheritance of poor vascular tissue, this would not explain the occurrence in both husband and wife of cardiovascular syphilis. It remains to be seen if there exists a strain of spirochete with special affinity for vascular tissue.

---

[11] Syphilis and the Nervous System (English translation), 1913.

[12] Jour. Amer. Med. Assoc., 1914, lxiii, 466.

An instance of familial cardiovascular degeneration, of which syphilis appears to be the cause, is the following:

The grandparents died from cardiac disease, an uncle in early life of apoplexy, and an aunt suddenly from heart disease. One living aunt had had several strokes of apoplexy, and her unmarried sister gives a positive luetin test, though a negative Wassermann. Two of the third generation are unmarried—middle-aged women with hypertension. One gave a positive luetin with a negative Wassermann. In the other both tests were negative, but as a girl she had a persistent ulceration of the rectum which was followed by a stricture that required removal. One brother who knows of no infection gave a positive luetin test, another is stated to have a chronic ulcer near his anus and to "shed the soles of his feet" periodically. A third brother died suddenly of heart disease when sixteen years old. In view of the family and personal history the sister with hypertension in whom both the Wassermann and the luetin tests were negative is classed as luetic. The mother of this generation died suddenly of cardiac dilatation following pneumonia, and the presumption seems warranted that she probably had a syphilitic myocarditis.

What we might term "the syphilitic lead" in the history of Case 21 is not so much that both parents and a sister died from nephritis, as the fact that the patient and two of her sisters all became deaf in early womanhood without apparent cause. Insidious deafness is a common result of congenital lues. It is noteworthy that the highest pressure (270 to 280 auscultatory, wide cuff) was in a woman with an hereditary infection. Only once have I met with a higher pressure, and that was in an unmarried woman, aged forty-nine years, whose mother, aged sixty-nine years, had died of a "shock," though she had her first stroke several years before. In this woman the systolic pressure was 300, diastolic 160, and there was an accompanying aortitis and nephritis. It seems quite possible that this was an inherited syphilis also. The further history of this case is of interest. She developed a tonsillar diphtheria one week after I saw her, and though she had antitoxin promptly, she died in about a week from cardiac failure; the pressure steadily fell until the end.

Several of these cases would not have been detected except for my custom of examining, whenever possible, the parents of patients suspected of having hereditary syphilis. In one instance the mother of a young man with interstitial keratitis was found to have a blood-pressure of over 160.

In another case the father of an anemic child with a positive Wassermann and of two children who were deaf and dumb was found to have hypertension and a strong luetin reaction. In a third instance the mother of a girl who had precordial pain, had an aortitis and systolic blood-pressure of 194. The mother's sister also had aortic disease with a systolic pressure of 220.

Case 31 is of interest, as mercury and salvarsan are theoretically contra-indicated with marked kidney involvement. Notwithsatanding that the patient had diabetes and eliminated only a trace of 'phthalein in two hours, she experienced much symptomatic relief from three injections of neosalvarsan and a course of mercury injections combined with the iodide of potassium. She was first given mercury by mouth, then by injection, and as no untoward effects were noted, neosalvarsan was finally administered. The amount of 'phthalein eliminated a year later was over 15 per cent. The blood-pressure was lower and the patient felt much better. The Wassermann is still very positive, though the general condition is good, except for glycosuria.[13]

A woman, aged forty-two years, consulted me because of increasing weakness and a thoracic pain which she feared might be due to pulmonary disease. There was nothing to be found in her lungs, but her systolic pressure was 170, diastolic 115. The Wassermann reaction, even with fortified antigens was negative. Upon questioning her husband I learned that he had an initial lesion twenty-two years previously, for which he had received practically no treatment. He was married sixteen years ago and four years later he had a recurrence of mucus patches and sore throat which subsided after a few weeks' medication.

He considers himself in perfect health, but his Wassermann is strongly positive and both he and his wife gave a marked luetin reaction.

Of especial interest in this case is the fact that an innocent infection may take place years after the chancre from recurring mouth lesions. It also demonstrates that apparent health is compatible with an active syphilitic infection as revealed by the Wassermann test.

The accompanying illustration shows the wife's luetin reaction, and is typical of the average reaction obtained in this series. In three or four cases, however, the resulting pustule was very much larger than the one shown here.

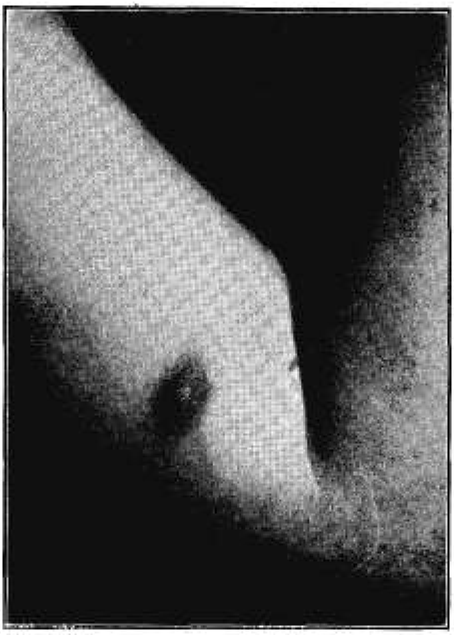
While it is true that a high percentage of hypertensive cases are suffering from interstitial nephritis, Gull and Sutton asserted years ago that similar changes could be found in the smaller arteries throughout the body, though they were usually most marked and easiest of demonstration on the kidney. This conception of hypertensive disease, as a condition affecting the smaller arterioles throughout the body, is the one generally accepted today.

---

[13] The day proof was corrected she died after being comatose three days. Excellent health up to first convulsion. *Urine* loaded with sugar.

In some of these cases the examination of the urine suggested a small granular kidney; in the majority it was negative. Several were given the 'phthalein kidney function test and the results are recorded in a separate column. For the most part good function is shown.

GROUP II.—The cases of apoplexy, fifteen in all, were nearly all patients in the Hartford Hospital, and in only a few could any history be obtained, owing to their mental condition. Six were under sixty and nine were older. The oldest was a hale old man of ninety-one, who made an excellent recovery from a slight shock.



Positive luetin reaction in woman with hypertension whose Wassermann was negative. In addition to the pustule there is a well-marked areola. Both the Wassermann and luetin tests were positive in the husband.

He had an initial lesion nearly fifty years before, though he remembered no secondaries. His leutin test was definitely positive. Of the group under sixty, 20 per cent. gave a positive Wassermann reaction and 83 per cent. a positive luetin. Only one of the older group had a Wassermann, and it was negative. The luetin was positive in 55 per cent. of those over sixty. This group is so small that one would be unwarranted in concluding that the same percentage would obtain in a large series. It demonstrates, however, that syphilis is a very common factor in apoplexy, irrespective of age.

The spinal fluid was examined in five cases of apoplexy. In several there was a slight cellular increase and a positive globulin test with a negative Wassermann reaction and a positive luetin. The Wassermann in blood and spinal fluid agreed in all cases. In most instances only 0.2 c.c. of fluid was used; with larger amounts the percentage of positive Wassermann's would probably have been somewhat higher. Two cases were of specially interest as showing the difference between an acquired infection and one that was presumably congenital. A man, aged fifty years, with a right hemiplegia, was referred to me by Dr. E. A. Wells. He had had a chancre some years before. The Wassermann in both blood and spinal fluid was very positive, and in the latter there was a marked globulin increase; cells not counted. The other, a man aged thirty-six years, with a left hemiplegia, was seen with Dr. Cantarow. He denied absolutely any venereal infection and the arch of his palate was exceedingly high and narrow, which is almost pathognomonic of hereditary lues. The blood and spinal fluid Wassermann reaction was negative, though 1 c.c. of fluid was used. There was no cellular increase and no globulin. Both patients exhibited a strong luetin test.

GROUP III.—It was my privilege to test seven widows whose husbands died from cardiovascular or renal disease in middle life. The Wassermann was done in six, and was positive in half (50 per cent.); the luetin test was positive in all (100 per cent.), though in one in whom the Wassermann was very strong it did no develop until the sixth week.

GROUP IV.—Group IV is made up of thirty-seven individuals, children and adults who knew of no venereal infection, and who either gave a history of parental death from heart disease, apoplexy, or "kidney trouble" (usually in early life), or had a parent living with one of the above maladies. The latter were few. Twelve of this group were included in the Class B of Group I. Thirty-four, or 89 per cent., gave either a positive Wassermann or luetin reaction. Many appeared to be in good health, but the majority had some complaint, and in a number of instances symptomatic improvement followed syphilitic treatment. I do not consider this percentage as fairly estimating the amount of hereditary lues in cardiovascular families. As nearly a third of the cases were patients who came for examination because of some evidence of ill health, this percentage would have undoubtedly been lowered considerably if the number of apparently healthy individuals studied had been greater. In a previous study of syphilitic families irrespective of health, I found 59 per cent. to be infected, and of those who appeared to be perfectly healthy, the luetin test was positive in 39 per cent.

Furthermore, it by no means follows that the various symptoms complained of by this group were in each instance due to lues, solely because the Wassermann or luetin test was positive. The patient with aortitis may have gall-stones, or the stomach symptoms may be due to cancer, even though lues is admitted. Nor are we justified in assuming that in all of this group the infection was hereditary because no history of infection could be obtained. Granting these limitations, the fact remains that a large percentage of the offspring of cardiovascular parents have a prenatal infection. (See Case 10.)

It is probably true, and indeed most fortunate, that syphilitic infection does not always mean clinically syphilitic disease. By this I mean that an infection may be more or less dormant for years and finally die out without in any way appreciably affecting the health of its host or shortening his life. But while admitting this possibility, we have as yet no means of ascertaining in which case this will happen and in which disaster will follow.

Most of the Wassermann tests in this series were made by Mr. R. V. Story at the laboratory of the State Board of Health, which is under the direction of Prof. Conn, of Wesleyan. A number were done by Dr. Jessie Fisher at the State Hospital at Middletown, one in the laboratory of Dr. J. A. Fordyce, of New York, and several by Drs. Russ and Brayton, of this city. The luetin was very kindly supplied by Dr. Noguchi, of the Rockefeller Institute.

Cholesterinized antigens were employed in thirteen cases, and their more general use would have given a somewhat higher percentage of positive results. Nevertheless, several negative results were reported from each of the four laboratories in late congenital cases when the luetin test was positive; this was obtained several times even when fortified antigens were used. Provocative injections of salvarsan would undoubtedly have increased the number of cases exhibiting a positive Wassermann, but even if the reaction remains negative, lues cannot be absolutely excluded. The luetin reactions were for the most part of unusual severity, probably due to the fact that the patients were, as a rule, given a small amount of potassium iodide for a time previously. This seems to "activate" the test even better than mercury or salvarsan.

The luetin test has been used about 10,000 times, Dr. Noguchi tells me, by over 100 different observers, and with but very few exceptions all agree that the test is specific for lues; as specific in fact as the tuberculin test for tuberculosis.

Kaliski,[14] testing Hebrews at the Montefoire Home, questioned the specificity of the papular type of reaction. It seemed incredible to him that so many orthodox Hebrews could have a latent syphilitic infection, especially in the absence of the more common signs of syphilitic disease.

As a matter of fact, syphilitic disease, especially of the aorta, is very common in this race. That in many cases the luetin test may be an indication of an hereditary infection is a possibility that has so far received insufficient consideration.

---

[14] New York Med. Jour., 1913, xcviii, 24.

In a few instances where "activation" with mercury and potassium iodide was omitted before giving the test the reaction was papular in type and of moderate severity, while the Wassermann was very positive. Emory,[15] Wilson,[16] and others have drawn attention to the fact that in the late manifestations of hereditary syphilis the luetin test is more often positive than the Wassermann.

Vedder and Borden,[17] comparing the Wassermann and the luetin test in a series of over 700 individuals in whom they employed cholesterinized antigens, say "it is apparent that in tertiary latent and treated cases the luetin test is apparently more efficient in detecting syphilis than the most efficient Wassermann." Eighty per cent. of the patients tested by Borden and Vedder were between fifty and eighty years of age, and suffered from the various degenerative processes that attend that period of life. The combined results of the Wassermann and the luetin test revealed the fact that over 45 per cent. had been infected with syphilis.

Valuable as the Wassermann and the luetin tests are in the diagnosis of obscure cases, it is very unfortunate when they are used as short cuts to diagnosis, as neither test is infallible. It takes less time to obtain blood for the Wassermann reaction than it does to go over the family and personal history with a fine tooth comb, as it were. A carefully obtained history may be supplemented but not supplanted by either the Wassermann or luetin test.

Treatment.—In addition to the usual regime adopted in these cases it was possible to observe the effect of specific treatment on several patients. The number is altogether too small, however, to draw any conclusions as to the relative value of the different forms of antiluetic treatment. Mention has been made of the great improvement in a patient with aortitis and diabetes who was excreting only a trace of 'phthalein in two hours.

I am far from being sure that salvarsan is indicated in all cases. Sometimes an important military position can be taken by a long siege where an assault would fail. Several patients have exhibited very satisfactory improvements in subjective symptoms, usually coincident with some lowering of the blood-pressure following several months of mercury injections combined with potassium iodide by mouth. Inunctions give satisfactory results, but their field of usefulness is limited in private cases.

Mercury by mouth has not seemed to be so efficacious. The urine of these patients has been carefully watched and rarely has there been signs of kidney irritation. In four instances the kidney function was determined before treatment was instituted and several months later. The results are shown in the following table.

---

[15] Lancet, 1914, i, 223.

[16] Quoted by Armstrong, vide note 2.

[17] Vedder and Borden, Jour. Amer. Med. Assoc., 1914, lxiii, 1750.

TABLE SHOWING PHENOLSULPHONEPHTHALEIN ELIMINATION.

Before treatment.					After treatment.				
Case No.	Date.	*Per cent.* 1st hour.	*Per cent.* 2d hour.	Total per cent.	Date.	*Per cent.* 1st hour.	*Per cent.* 2d hour.	Total per cent.	*Medication* used.
23	June 4, 1913	22	7	29	Feb. 3, 1915	47	22	70	Hg. injections; KI.
25	July 1, 1914	29	20	49	Feb. 21, 1915	56	20	76	Hg.; neosalvarsan and salvarsan.
47	May 5, 1914	39	10	49	Feb. 4, 1915	32	25	57	Hg. injections; KI.
39	Jan. 21, 1914	Trace	Trace	Trace	About June 15, 1914	Trace	Trace	less than 10	Hg. mouth; Hg. injection; neosalvarsan; KI.
					Feb. 22, 1915	Trace	15	15	

Two cases might be cited as illustrating the possibilities and limitations of specific therapy:

A married woman, aged sixty-five years (Case 23), was referred to me by Dr. Frederick Crossfield because of dyspnea. There was marked pulsation in the carotids, and the systolic pressure was 190 and diastolic 85. Rest in bed and purgation enabled her to lie comfortably with head low, but when she began to get about again in two weeks the pressure rose to over 160. For the next three months she was given injections of mercury, at first the biniodide, grain $\frac{1}{6}$, twice a week, and later the salicylate, grain $\frac{1}{10}$ weekly, together with KI by mouth. Her improvement has been most gratifying. Last summer, after a morning of "canning," her pressure was 140 and once since then was 130, though it averages about 160. Three Wassermanns were negative, but the luetin test was very strong. The increase in the 'phthalein output after several months' treatment is shown in the preceding table.

In contradistinction to this is the young woman whose systolic pressure was 270. When she had as much improvement as could be expected from the usual dietetic-rest-hot bath regime, she was given three injections of neosalvarsan and a number of mercury, though the family was told it was questionable if any improvement would follow. In the months succeeding the treatment she seemed to have a little more endurance and was much brighter. Her speech, which had been thick, improved considerably. A cough that had persisted for many months, accompanied by purulent sputum in which tubercle bacilli were never found, completely disappeared. The systolic blood-pressure remained, however, at about 270, and I cannot feel that the treatment was of any great benefit. In view of the extensive structural changes that attend such high pressure it does not seem reasonable to expect any treatment to avail. Had it been possible to have detected her syphilitic infection in her childhood as it would be today, and had she received a thorough course of treatment through a period of several years, this tragedy of middle life might have been avoided. By promptly stamping on the fuse a calamity may be averted. After the explosion there are only tears and regrets.

The results of this investigation can be summarized as follows:

1. Syphilis is the underlying or basic factor in a much higher percentage of hypertensive cases than has hitherto been realized. Of 50 individuals studied 90 per cent. either gave a positive Wassermann or luetin test, or were known to have had lues, or had children with hereditary syphilis.
2. Nineteen were from cardiovascular families. In seventeen of them either one or both test were positive. One of the two with negative reactions is surely specific. This strongly suggests the existence of what might be termed "familial cardiovascular syphilis."
3. It would seem that hypertensive disease is one of the most common—possibly the most frequent—of the so-called "late" manifestations of hereditary syphilis.
4. Apoplexy and sudden cardiac death occurring in middle life are almost always due to syphilis, and it cannot be considered a negligible factor even in the aged.
5. The remaining parent and the children of individuals dying a cardiovascular-renal death in middle life should be tested for syphilis as they are infected in a high percentage of cases.
6. Specific treatment has given very satisfactory results in a few cases for the most part individuals whose systolic pressure was under 200. The careful administration of mercury over a period of several months has not appeared to be injurious to the kidney even when there was considerable reduction of 'phthalein output. In a few instances the kidney function was increased several months after treatment.
7. The luetin test, especially if activated by a week of mixed treatment, is often of more value than the most sensitive Wassermann in detecting these late manifestations of syphilitic infection.

TABLE I.—CASES WITH AN ACQUIRED INFECTION (CLASS A).

CASE 1.—Male, aged fifty-nine years. *Diagnosis*—hypertension; systolic, blood-pressure, 195; diastolic blood-pressure, 85. *Personal History*—had syphilis years ago; perforation of nasal septum. *Wassermann:* + +.[18] *Luetin*—not done.

---

[18] Wassermann reactions showing 50 per cent. inhibition are reported +. Those exhibiting more complete inhibition (75 per cent.) and the completely positive reaction, ++. The use of cholesterinized antigens indicated by *. The luetin test + signifies a papular reaction; ++ pustular; the very strong reaction, +++.

CASE 2.—Male, aged fifty-three years. *Diagnosis*—hypertension; systolic blood-pressure, 200. *Family History*—wife had several miscarriages; one child with hare-lip and imperforate anus. Family history good. *Personal History*—denies lues; alcoholic. *Wassermann:* +.* *Luetin:* + − and again + −.

CASE 3.—Female, aged fifty years. *Diagnosis*—hypertension; systolic blood-pressure, 184; diastolic blood-pressure, 120. *Family History*—husband, general pains; son, hypertension and high, narrow palate with luetin, +. Daughter very narrow palate with Wassermann strongly positive. *Wassermann:* −.* *Luetin:* −.

CASE 4.—Female, aged forty years. *Diagnosis*—hypertension; systolic blood-pressure, 195; diastolic blood-pressure, 110. *Family History*—husband has positive Wassermann. *Wassermann:* ++.* *Luetin*—not done.

CASE 5.—Female, aged sixty-two years. *Diagnosis*—aortitis; syphilis of liver (autopsy); systolic blood-pressure, 180. *Family History*—negative. *Personal History*—husband had "soft chancres" a short time before marriage. *Wassermann*—not done. *Luetin:* + + +. *Kidney Function*—first hour 22, second hour 11, total 33 per cent.

CASE 6.—Male, aged forty-seven years. *Diagnosis*—aortitis, paresis; systolic blood-pressure, 190; diastolic blood-pressure, 120. *Personal History*—chancre twenty-five years ago. *Wassermann:* + +. *Luetin:* −.

CASE 7.—Male, aged thirty-eight years. *Diagnosis*—hypertension; systolic blood-pressure, 170. *Personal History*—eleven years ago had gonorrhea; no chancre; "rash" several weeks later. *Wassermann:* ++. *Luetin:* +++. *Kidney Function*—first hour 55, second hour 25, total 70 per cent.

CASE 8.—Female, aged fifty-eight years. *Diagnosis*—aortitis; systolic blood-pressure, 170; diastolic blood-pressure, 80. *Personal History*—husband dropped dead, aged twenty-seven years. *Wassermann:* −. *Luetin:* ++. *Kidney Function*—first hour 60, second hour 25, total 85 per cent.

CASE 9.—Female, aged forty-nine years. *Diagnosis*—aortitis; systolic blood-pressure, 190; diastolic blood-pressure, 85. *Personal History*—husband had some "disease" when married, and at once had wife start to take some medicine. *Wassermann:* −. *Luetin:* +++.

CASE 10.—Female, aged thirty-eight years. *Diagnosis*—hypertension; systolic blood-pressure, 165; diastolic blood-pressure, 100. *Personal History*—husband died of "shock," aged thirty-five years. *Wassermann:* + +. *Luetin*—at first negative; at end of six weeks +. A son and daughter have positive Wassermann; a second daughter, a positive luetin test.

CASE 11.—Female, aged forty-three years. *Diagnosis*—hypertension; systolic blood-pressure, 180; diastolic blood-pressure, 110.

Family History—father and mother died of nephritis. *Personal History*—a brother had a chancre several years ago. He is very alcoholic, and sister has been very devoted to him. The brother has a Wassermann reaction positive at present. *Wassermann:* ++. *Luetin:* +++.

Case 12.—Female, aged fifty-two years. *Diagnosis*—hypertension; systolic blood-pressure, 210; diastolic blood-pressure, 110. *Personal History*—husband had syphilis. Son has a syphilitic arthritis with luetin, +. Daughter, Wassermann, ++. *Wassermann:* +−.* *Luetin:* ++.

Case 13.—Female, aged forty-two years. *Diagnosis*—hypertension; systolic blood-pressure, 170; diastolic blood-pressure, 115. *Personal History*—husband had syphilis before married and a positive Wassermann now. Sore throat recurred afterward. Only pregnancy a miscarriage. *Wassermann:* −. *Luetin:* ++. *Kidney function*—first hour 40, second hour 10, total 50 per cent.

Case 14.—Male, aged fifty-two years. *Diagnosis*—diabetes; systolic blood-pressure, 170; diastolic blood-pressure, 110. *Personal History*—son and daughter deaf and dumb, another daughter anemic with positive Wassermann. Sexually promiscuous. *Wassermann*—not done. *Luetin:* ++.

Case 15.—Female, aged fifty-five years. *Diagnosis*—hypertension; systolic blood-pressure, 195; diastolic blood-pressure, 140. *Personal History*—son had angina (mild) with Wassermann, −. Luetin, +, cured by "606" and Hg.; daughter has severe headaches. *Wassermann:* −.* *Luetin:* +++.

Case 16.—Female, aged fifty-seven years. *Diagnosis*—aortitis; interstitial nephritis; systolic blood-pressure, 200. *Personal History*—daughter had optic neuritis; heart block; relief followed specific treatment. Wassermann. Luetin, ++. Son had headache. Wassermann, negative; luetin, +. *Wassermann*—not done. *Luetin*—not done.

Case 17.—Female. *Diagnosis*—hypertension; systolic blood-pressure, 170+. Dactylitis with necrosis. *Family History*—one stillbirth, two miscarriages, several children died young. Daughter had severe headache with Wassermann −, and Luetin +.

Table II.—CASES PRESUMABLY OF HEREDITARY TYPE (CLASS B).

Case 18.—Female, aged thirty-eight years. *Diagnosis*—aortitis; systolic blood-pressure, 180. *Family History*—two brothers died from heart disease, aged forty-five and fifty years. *Personal History*—husband knows of no venereal infection. *Wassermann*—not done. *Luetin:* ++.

Case 19.—Male, aged fifty-three years. *Diagnosis*—aortitis; systolic blood-pressure, 210; diastolic blood-pressure, 110. *Family History*—father dropped dead, aged forty-six; a twin brother dropped dead, aged forty-eight; a sister living has "heart trouble;" mother died, aged seventy-six, of arterial sclerosis. *Personal History*—knows of no venereal infection. *Wassermann*—after 0.45 neosalvarsan, –. *Luetin:* +++.

CASE 20.—Male, aged fifty-eight years. *Diagnosis*—aortitis; systolic blood-pressure, 242; diastolic blood-pressure, 142. *Family History*—father died, aged forty-eight, of erysipelas. Sister[1] died from an obscure abdominal lesion. Sister[2] died from a "cerebral lesion?" Sister[3] died with mental symptoms, and for years had arthritis deformans. Brother[1] lived one day. Brother[2] has had "muscular rheumatism" for years; no lues but a positive luetin test. *Personal History*—no venereal infection. *Wassermann*—after neosalvarsan, –. *Luetin:* +++. *Kidney Function*—first hour 15, second hour 15, total 30 per cent.

CASE 21.—Female, aged forty-five years. *Diagnosis*—hypertension; systolic blood-pressure, 162; diastolic blood-pressure, 106. *Family History*—father and mother died from nephritis, also one sister. A brother and sister have hypertension. Another sister has a positive luetin test. All three sisters became deaf in early womanhood. *Wassermann:* +. *Luetin:* ++. *Kidney Function*—first hour 60, second trace, total 60 per cent.

CASE 22.—Male, aged fifty-seven years. *Diagnosis*—hypertension; systolic blood-pressure, 180; diastolic blood-pressure, 110. *Family History*—father died from "shock," aged sixty-eight. Mother died at forty-five, cause? *Personal History*—no venereal infection. *Wassermann:* –. *Luetin:* +++.

CASE 23.—Female, aged sixty-five years. *Diagnosis*—hypertension; systolic blood-pressure, 190. *Family History*—father died young; cause? very alcoholic; mother died young. *Personal History*—always neurotic; first pregnancy a miscarriage. Husband has had no venereal disease. *Wassermann:* –. *Luetin:* +++. *Kidney Function*—first hour 22, second hour 7, total 29 per cent. See Table.

CASE 24.—Male, aged forty-eight years. *Diagnosis*—hypertension; systolic blood-pressure, 220. *Family History*—mother died at sixty-four, of kidney disease. *Personal History*—no venereal infection. *Wassermann:* –. *Luetin:* ++. *Kidney Function*—first hour 26, second hour 13, total 39 per cent.

CASE 25.—Female, aged forty-five years. *Diagnosis*—hypertension; systolic blood-pressure, 220; diastolic blood-pressure, 120. *Family History*—mother died at thirty-two, of heart disease. *Personal History*—for several years has had joint pains. *Wassermann*—two laboratories. *Luetin:* ++. *Kidney Function*—first hour 29, second hour 20, total 49 per cent.

CASE 26.—Male, aged forty-eight years. *Diagnosis*—aortitis; systolic blood-pressure, 208; diastolic blood-pressure, 120. *Family History*—father very alcoholic; mother died at forty-eight, cause?

Personal History—knows of no venereal infection; slight shock one year ago. *Wassermann*—not done. *Luetin:* +.

Case 27.—Female, aged forty-three years. *Diagnosis*—hypertension; systolic blood-pressure, 280; diastolic blood-pressure, 140. *Family History*—marked family history of cardio-arterial disease. See text. *Wassermann:* –. *Luetin:* ++. *Kidney Function*—first hour 27, second hour 17, total 44 per cent.

Case 28.—Female, aged forty-five years. *Diagnosis*—hypertension; systolic blood-pressure, 170. *Family History*—sister of No. 27. *Personal History*—persistent rectal ulceration as a girl. *Wassermann:* –. *Luetin:* –. *Kidney Function*—total for two hours 55 per cent.

Case 29.—Female, aged fifty-three years. *Diagnosis*—aortitis; systolic blood-pressure, 194; diastolic blood-pressure, 110. *Family History*—sister has aortitis; husband died of heart disease; daughter has angina and a very positive Wassermann. *Wassermann:* –.* *Luetin:* ++.

Case 30.—Female, aged forty years. *Diagnosis*—aortitis; systolic blood-pressure, 220; diastolic blood-pressure, 110. *Family History*—sister of preceding. *Wassermann:* +–.* *Luetin:* ++.

Case 31.—Female, aged sixty years. *Diagnosis*—hypertension; systolic blood-pressure, 180 to 220. *Family History*—father died at fifty, of heart disease; brother of Bright's disease at sixty-eight; brother of shock at sixty-eight. *Wassermann:* –.* *Luetin:* ++.

Case 32.—Female, aged forty-four years. *Diagnosis*—hypertension; systolic blood-pressure, 162; diastolic blood-pressure, 110. *Family History*—father died at sixty-four with Bright's disease of many years' duration; sister died of Bright's disease, aged fifty-three. *Personal History*—never strong; "growing pains" severe in childhood; "chronic fatigue." *Wassermann:* ++.* *Luetin:* ++.

Case 33.—Female, aged forty-six years. *Diagnosis*—arthritis of knee; hypertension; systolic blood-pressure, 160; diastolic blood-pressure, 80. *Family History*—for as many years as she can remember her mother had leg ulcers; all the children's teeth were "soft" and very poor. *Personal History*—the arthritis was markedly improved by specific treatment. *Wassermann:* – *Luetin:* ++.

Case 34.—Female, aged fifty-four years. *Diagnosis*—hypertension; hypertrophic arthritis; systolic blood-pressure, 190. *Family History*—father had a stroke at about fifty-five; mother had heart disease for years; died at seventy. A daughter has had very severe headaches for years. *Personal History*—had some psychosis several years ago. *Wassermann:* –.* Luetin –.

Case 35.—Female, aged forty-three years. *Diagnosis*—hypertension; systolic blood-pressure, 200+. *Family History*—mother living; heart and kidney disease for many years. *Personal History*—severe growing pains when girl. Skin over patellæ very "horny" for years. *Wassermann:* –.* Luetin ++.

CASE 36.—Male, aged forty-eight years. *Diagnosis*—aortitis; hypertension; systolic blood-pressure, 230; diastolic blood-pressure, 135. *Family History*—mother died of shock at eighty; brother died suddenly at thirty-five years; had had severe headaches for years; sister has albuminuric retinitis; another sister very severe headaches. *Personal History*—denies lues; hemiplegia five months before. *Wassermann:* negative. *Luetin:* ++.

TABLE III.—UNCLASSIFIED CASES WHO GIVE NO HISTORY SUGGESTING ACQUIRED INFECTION AND WHO HAVE GOOD FAMILY HISTORIES (CLASS C).

CASE 37.—Female, aged sixty-three years. *Diagnosis*—arterial sclerosis, aortitis and mitral stenosis; systolic blood-pressure, 169 (autopsy). *Family History*—husband died at fifty-six of "Bright's disease." *Wassermann*—after neosalvarsan, −. *Luetin*: +++.

CASE 38.—Female, aged sixty-seven years. *Diagnosis*—hypertension of over ten years' duration. Systolic blood-pressure, 200. *Family History*—negative. *Wassermann:* −. *Luetin:* −. *Kidney Function*—in 2 hours over 60 per cent.

CASE 39.—Female, aged fifty years. *Diagnosis*—aortitis; diabetes; nephritis. Systolic blood-pressure, 165; diastolic blood-pressure, 115. *Family History*—husband died at sixty-two of heart disease. *Wassermann:* ++. *Luetin:* ++. *Kidney Function*—first hour trace, second hour trace. See Table.

CASE 40.—Female, aged seventy years. *Diagnosis*—hypertension; arthritis. Systolic blood-pressure, 210. *Family History*—husband has angina; denies lues. Daughter "weakling," with Luetin, +. *Personal History*—has had several slight shocks. *Wassermann*—not done. *Luetin:* +. Probably belongs in Class A.

CASE 41.—Female, aged fifty-four years. *Diagnosis*—chororetinitis; systolic blood-pressure, 200+. *Family History*—husband died at age of fifty-seven of pernicious anemia. *Personal History*—twenty years ago lost sight of right eye; three months ago left eye began to fail. *Wassermann:* −. *Luetin:* ++.

CASE 42.—Male, aged forty-three years. *Diagnosis*—hypertension; systolic blood-pressure, 160+. *Family History*—daughter has intermittent claudication. *Personal History*—denies lues. *Wassermann:* −. *Luetin:* ++.

CASE 43.—Male, aged fifty-one years. *Diagnosis*—nephritis; paroxysmal hemoglobinuria; systolic blood-pressure, 170+. *Family History*—daughter of poor mental development; very nervous; high palate. Strong luetin reaction. *Personal History*—denies lues. *Wassermann:* −*. *Luetin:* +.

CASE 44.—Female, aged fifty-three years. *Diagnosis*—aortitis; systolic blood-pressure, 170; diastolic blood-pressure, 70. *Wasser-*

mann: ++.* *Luetin:* −. *Kidney Function*—first hour 50, second hour 18, total 68 per cent.

Case 45.—Female, aged sixty years. *Diagnosis*—carcinoma of liver and gall-stones. Systolic blood-pressure, 172; diastolic blood-pressure, 90. *Family History*—negative. *Wassermann:* −. *Luetin:* −.

Case 46.—Male, aged fifty-eight years. *Diagnosis*—detached retina; hypertension; systolic blood-pressure, 185. *Family History*—brother at thirty-eight had slight "stroke." He had no known venereal lesion. *Personal History*—no venereal infection. *Wassermann:* −. *Luetin:* ++.

Case 47.—Female, aged sixty-one years. *Diagnosis*—aortitis; systolic blood-pressure, 190; diastolic blood-pressure, 85. *Family History*—husband has angina, though he denies lues. *Wassermann*—later. *Luetin:* ++. *Kidney Function*—first hour 39, second hour 10, total 49 per cent.

Case 48.—Male, age about fifty years. *Diagnosis*—aortitis; systolic blood-pressure, 200; diastolic blood-pressure, 100. *Personal History*—denies infection. *Wassermann:* ++. *Luetin*—not done.

Case 49.—Female, aged forty-eight years. *Diagnosis*—hypertension; systolic blood-pressure, 184; diastolic blood-pressure, 84. *Personal History*—husband a drunkard; suicide. *Wassermann:* +.* *Luetin:* +.

Case 50.—Female, aged sixty-four years. *Diagnosis*—hypertension; systolic blood-pressure, 200+. *Family History*—hypertension for ten years; negative. *Personal History*—negative *Wassermann*—not done. *Luetin:* ++.

LATENT SYPHILITIC INFECTION OF THE LUNGS.

By H. R. M. Landis, M.D.,
and
Paul A. Lewis, M.D.,
PHILADELPHIA.

The only type of pulmonary syphilis about which there is a general agreement is that seen in newborn syphilitic children. In this form of the disease, gummata may occur, but, as a rule, they are rare. The typical lesion is that known as white pneumonia. The lung presents on section a dry, smooth surface, grayish or yellowish white in color, resembling closely the cut surface of the pancreas. The process may occur in scattered patches throughout both lungs or may involve the entire lobe. This type of pulmonary syphilis is, for the most part, of pathological interest only.